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ABSTRACT

This paper reviews the literature in three areas of change in college teaching--peer teaching or tutoring, individualized instruction, and cooperative learning. The focus of the paper is how knowledge is acquired, and acted upon, by students. The advantages and disadvantages of each type of teaching are explored, as well as the rates of successful acquisition of the subject matter and the reactions of students to the different ways of learning. The review concludes that lecture and discussion do have some value in the college classrooms, but that practitioners in higher education should explore adapting the stereotypical class dominated by lecture to one defined by activity and participation. (Contains 57 references.) (EH)

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There's Got to be a Better Way:

Alternatives to Lecture and Discussion

Judy D. Butler

SO 026 559

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Introduction

The stereotypical college classroom is one in which a professor lectures while students quietly take notes. Obviously, this stereotype has not been valid in the United States for some time. For many years we have had labs for science, language and computer classes, workshop classes, seminars and various forms of peer evaluation (Barratt, 1992). However, Pollio (1984) estimated that teachers in most institutions spend 80 percent of their time lecturing to students, who in turn are attentive some 50 percent of the time. There is little evidence that lecturing is any less efficient in delivering subject matter knowledge than instruction that involved discussion (Dunkin & Barnes, 1985; Kulik & Kulik, 1979; McKeachie, 1962; Ryan, 1969). Pascarella and Terenzini (1991, p. 88) conclude that lecture is less effective when the goal of instruction is higher order thinking skills. In an extensive study done by Ristow and Edeburn (1983) to assess the learning styles of college students, the majority of college students showed high preferences for peer teaching, discussion, teaching games, programmed instruction and lecture. Females, as opposed to males, preferred collaborative approaches. Average, as opposed to high-achieving, students preferred discussion. In today's world, alternative forms of teaching strategies better serve the students, both as individuals and as productive citizens. Among the reasons for this assumption are:

- ★ There are certainly classes in which we hope students learn beyond the knowledge level.
- ★ Work situations are changing from ones dominated by a spirit of competition to ones dominated by collaboration.
- ★ Accommodation for varied learning styles, including proclivities native to different cultural groups, is necessary in our pluralistic society.

- ★ There is so much information available today that one professor cannot possibly deliver it all in lecture. Other strategies are mandatory to expose the student to that plethora of information.

- ★ By lecturing only, professors are not effectively modeling for students the kind of teaching/learning situations they will face in their future lives.

Academicians co-author papers; people in business write joint reports; teachers team teach; physicians operate in groups; military operations are planned for units and corps; fast-food trainees learn by computer programs and training films; productivity is measured by the output of crews. Colleges must repond; professors must respond, to the changes thrust upon us by our diverse and dynamic society, as well as to the wonders of the age of technology.

Thesis

The purpose of this paper is to review the literature in three areas of change in college teaching -- peer tutoring, individualized instruction, and cooperative learning. Specifically, the advantages and disadvantages will be explored, as well as the rates of successful acquisition of the subject matter and the reactions of students to the different ways of learning.

The large body of research is diverse and extensive (Pascarella & Terenzini, 1991, p. 87). The kinds of studies and different instructional approaches are as unique as the individuals who develop and use them. This review has been narrowed to the three areas listed above because within each are the most common alternatives to lecture and discussion.

One note of clarification is necessary concerning that which Pascarella and Terenzini (1991) labeled visual instruction. Many professors use video tapes, slides, and other forms of technology, to convey information in much the same way they have used lecture for years. The focus of this paper is how knowledge is acquired, and

acted upon, by students. How professors organize data for presentation is fodder for a different study.

In addition, Pascarella and Terenzini (1991) mention team teaching, which is becoming rather common place on college campuses. The literature is rich with studies on this approach and the variety is endless (e.g., Benin & Lewandowski, 1991; Bartlett & Byrd, 1980; Schustereit, 1980). There are as many articles favoring team teaching as there are criticizing it (Pascarella & Terenzini, 1991, p. 88) and drawing conclusions about its effectiveness, or ineffectiveness, is difficult. A review of that literature is also not elaborated on here, because it, like visual-based instruction, is more involved with the actions of the teacher, as opposed to the interaction of students with content and with one another.

Peer Teaching or Tutoring

One way faculties have sought to increase students' involvement in learning is through peer teaching, or tutoring (Goldschmid & Goldschmid, 1976). Most of the research has suggested that peer tutoring, and/or teaching, has positive results (Annis, 1983; Bargh & Schul, 1980; Fraser, Beaman, Diener & Kelem, 1977, House, 1988; King, 1990; Levine, 1990). One of the most significant findings is in research by Benware and Deci (1984) who hypothesized that learning to teach facilitates intrinsic motivational processes that result in greater conceptual learning. One group of students in a psychology class was asked to learn data with the purpose in mind of teaching it to someone else, while another group was told merely to learn the material for a test. The results showed that there had been higher conceptual learning among the students preparing to teach. That group also perceived themselves to be more actively involved in the course than did the other students. Bargh and Schul (1980)

suggested that the cognitive benefits of learning to teach result from the use of a different and more comprehensive method of study than that used to simply prepare for a test.

A broader view of this theory is seen in Pace's (1980, 1984) assumption that what a student gets out of college is dependent not only upon the conditions at the school, but more specifically upon the quality of effort that the student puts into college. Tinto would surely agree.

Another related matter is the idea that students benefit from building relationships with faculty, If peer teaching is a part of an activity that is (as it should be) closely monitored by a professor, then an added benefit is the relationship that may be built between the faculty member and the student.

As with Bragh and Schul's (1980) conclusions, the literature seems to indicate that the big advantage to peer tutoring is the intrinsic nature of what is learned by preparing to teach. As with any teaching strategy that takes control out of the hands of the teacher, a major perceived disadvantage is the lack of control over what information is encountered by the student. The idea that certain bits of knowledge are necessary for everyone to know before attempting advanced courses keeps many from trying ideas such as peer tutoring. The bulk of the positive reports seem to come from process oriented subjects, such as mathematics, writing, and lab courses of various kinds, including both science and language.

One particular study of special interest is that reported by House (1988) on mathematics, in which he sought to learn if same-sex tutors made a difference in that discipline. Using a population of 333, his study showed that students did better with a tutor of the same sex. When content is the focus, such as in a typical history class,

there is no proof that this, or any other, form of alternative instructional strategy is any more effective than lecture and discussion.

There is a comprehensive study of peer tutoring in the 1988 Association for the Study of Higher Education report entitled, Peer Teaching: To Teach is to Learn Twice. The conclusions set forth in this report are:

- ★ Although students have traditionally been expected to learn independently, learning also occurs when students work cooperatively.
- ★ Both teachers and learners learn.
- ★ Involving students in planning peer programs develops future teachers.
- ★ Students like to become peer teachers to build relationships with faculty.
- ★ Learning may increase with a blend of situations that include those where professors are present and are not present.

Individualized Instruction

The principle criticism of lecture, and even discussion, is that such does not allow for a variety of learning styles, nor does it accommodate for different rates of learning. Two studies, Carroll's (1963) and Bloom's (1968), although developed primarily in regards to elementary and secondary education, have greatly influenced collegiate instruction. Approaches that have evolved from those studies, and others similar to them, include (but are not limited to) --

- ★ audio-tutorial instruction, as developed by Postlethwaite.
- ★ computer-based instruction.
- ★ personalized system of instruction, best known as the Keller Plan.
- ★ programmed instruction.

The audio-tutorial approach (Postlethwaite, Novak & Murray, 1972) combines the use of a learning center, team teaching and seminars. Students do a certain

amount of work individually in the learning center, meet weekly in small groups with instructors (perhaps graduate assistants), and meet together in a general session for motivational lectures, films and major exams. Kulik (1983), and his colleagues, as well as Aiello and Wolfe (1980), studied the effectiveness of this method and concluded that student achievement went up. There were no measurable attitudinal differences among students in their affinity for audio-tutorial approaches as opposed to traditional lecture and discussion.

The same group of professors also evaluated computer-based instruction (CBI) and found that, in over 59 studies, there was a statistically significant effect of .25, favoring CBI over traditional instruction. In addition, student attitude toward this type of instruction was positive and there was a significant reduction in the hours per week needed for instruction. Exploration and study are ongoing in this field, since the development and marketing of such programs are quite popular. In fact, I could have done this entire paper on the techniques of developing enumerous varieties of these programs. Of those scanned, Willis's (1991) outlining and explaining six different models seemed most usable by novices.

Tudor and Bostow's (1991) study compared the student success rate of one group who had to covertly respond to programmed questions, with another group who only read through a text. The results were those who had to respond, scored better on the posttest. Dwyer (1985) investigated pacing levels within PSI's that were computer based and concluded that permitting students to interact totally self-paced may not be the best method of facilitating student achievement.

Computer-based instruction, needless to say, is growing in both popularity and availability. It involves the interactive use of a computer. Programmed instruction, drill and practice, and/or tutorial exercises, are frequently implemented through this

medium. Various forms of interactive learning, combining computers and satellites, are now available. Laser discs have revolutionized the depth and degree of training that can be done this way. However, the human touch will never be there. The lack of the ability to interact at random with another human being will always be the major drawback to this form of instruction.

Personalized systems of instruction (PSI) are those most often associated with Keller, due to his extensive research in the sixties. The early forms were paper and pencil variety. Today, most often these programs are computer-based. This type of instruction is characterized by:

- ★ small modularized units of instruction.
- ★ study guides.
- ★ mastery orientation and immediate feedback through unit tests.
- ★ self-pacing.
- ★ student proctors to assist with unique problems.
- ★ occasional lectures.

Many of these kinds of activities are for acquisition of basic skills, such as those in math. In a 1990 study, Henderson and Henderson, found that students taught by the lecture method produced more A's than F's and that the self-paced class had more dropouts than the lecture class.

The evidence, however, is overwhelming contradictory to that study. Numerous others proved quite the contrary, including those of Smith (1987), Robinson (1990), Gifford and Vicks (1982), Hunziker (1985), Davies (1981), Karp (1983) and Sheese (1981). Sheese's study was quite comprehensive. It included not only the success rate, but the different kinds of instruction and a breakdown by subject area, which

indicated that PSI is used most often in behavioral sciences and least in business. Student reactions were documented and proved generally supportive of PSI.

Pascarella and Terenzini (1991, p. 90) conclude that steps to individualize instruction are the single most dramatic shift in college teaching . They also conclude that individualized instructional approaches are equally effective across nearly all content areas in which they have been implemented. However, they have not been attempted equally across the content areas. This is certainly a diverse area and one in which ongoing study is prolific.

Cooperative Learning

Perhaps the most current thinking in K-12 education, cooperative learning is making its way into college courses, as well. In studying the literature, and drawing upon my own experiences in this area, I discovered that many professors who have written about their success in "supportive learning" are really describing elaborate group work. Although it is certainly an effective tool, group work does not have the dynamic that true cooperative learning does, i.e., a setting in which the group's accountability is determined by the accountability of each individual and vice versa. In vintage cooperative learning, one or two people cannot carry the group. Each person has a "piece of the pie." The research on cooperative learning can be summarized in this way:

- ★ The most successful approaches incorporate group goals and individual accountability.
- ★ When that is done, achievement effects are consistently positive; 37 of 44 experimental/control comparisons have found positive effects and none have favored traditional methods.

- ★ Achievement effects have been found to be consistent at all age levels, in all major subjects, and in urban, rule and suburban settings, and effects are equally positive for high, average and low achievers.

- ★ Positive effects have been consistently found in a diversity of outcomes, including self-esteem, intergroup relations, acceptance of academically handicapped, attitudes toward school and the ability to work cooperatively.

The leaders in this field are Johnson and Johnson (1974) and Slavin (1983, 1990). There are volumes that have been written about the subject, but much of that work concerns elementary students. At the college level, the most promising studies are those dealing with teacher education (e.g., Glass & Putnam, 1989; Jones, 1989; Millis, 1990; Nattiv, Winitsky & Drickey, 1991; Peters & Stuessy, 1991; Prescott & Wolfe, 1990; Smith, 1990).

The research on cooperative learning has shown phenomenal gains in academic achievement and significant improvement in social relationships (Slavin, 1983), but the research , for the most part, has been limited to grades K-12 (Nattiv, et al. 1991). The most comprehensive report dealing with cooperative learning in the college setting is that of Nattiv, Winitzky and Drickey (1991). Involving preservice teachers and based largely on Kagan's (1988) ideas, the strategies used were narrowed from the over 50 described by Kagan to seven. The rationale for using cooperative learning in this setting was, of course, that these students were going to be asked to teach in this style when they entered the profession.

Students are more likely to use methods of teaching that they have experienced (Copeland, 1979; Joyce & Showers, 1982). While the emphasis of the studies in K-12 education focuses on acquisition of data, all the benefits outlined for K-12 are equally valued in higher education, e.g., enjoyment of learning, higher academic attainment, growth in interpersonal relationships.

Research in higher education across the various disciplines has been fairly limited. Dansereau (1988) focused on the effect of cooperative learning strategies on cognitive processes in a series of studies with university students at Texas Christian University. He learned that students gained more from learning in pairs than from working along, Sherman (1986) used cooperative learning in educational psychology courses at Miami University of Ohio. There were no differences on achievement levels, but students in cooperation learning sessions evaluated their experiences much more highly. Davidson (1990) reported similar results with college mathematics students. Frierson (1986) reported that African-American nursing students studying cooperatively achieved higher scores on their state nursing exams than did the control group. Treisman (1985) used cooperative learning groups with incoming African-American math and science majors. GPA's, retention rate and graduation rates were higher for the students in the cooperate groups than in the control group. Owens (1985) demonstrated than women prefer the cooperative learning more than men. Cooper and his colleagues (Cooper Prescott, Cook, Smith, & Mueck, 1990) have produced a handbook on cooperative learning strategies for college teachers. Graves (1988) has produced an annotated bibliography on cooperative learning in higher education (which I wished I could have).

The conclusions are that cooperative learning on the college level is just as viable and just as beneficial as it is on any other level. Students appreciate the shared workload and shared responsibility as well as the experience with coauthorship. Instructors appreciate increased student learning and increased student motivation, as well as a reduction in paper grading in some settings.

Conclusion

There is no intent in this study to prove that lecture and discussion are antiquated and need to be eliminated. On the contrary, research shows that for learning content, these two approaches to teaching are most efficient and productive. There are, also, some subjects that are more difficult to adapt to the approaches discussed in this paper. The research does show, unequivocally, that such interactive methods as peer tutoring, personalized instruction and cooperative learning have attributes professors might find beneficial. And, they have particular advantages in classes of pre-service teachers. The data has shown that, generally speaking, students perform better on assessment tools, their perception of their learning experience is positive, and experiences such as these assist in persistence. Therefore, practitioners in higher education should explore adapting the stereotypical class dominated by lecture to one defined by activity and participation.

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